RINGKASAN

Enzim protease merupakan enzim yang berfungsi menghidrolisis protein menjadi peptida dan asam amino. Setiap enzim memiliki kondisi atau aktivitas optimal berbeda-beda. Aktivitas enzim dipengaruhi oleh berbagai faktor diantaranya adalah pH dan suhu. Penelitian ini bertujuan untuk mengetahui pengaruh pH, suhu, dan kombinasi keduanya terhadap aktivitas enzim protease dari isolat LG-37 asal sedimen mangrove Pantai Logending.

Metode penelitian dilakukan secara eksperimental menggunakan rancangan acak lengkap (RAL) pola faktorial dengan dua faktor. Masing-masing faktor tersebut dilakukan pengulangan tiga kali. Faktor pertama yakni variasi pH 4, 5, dan 6, sedangkan faktor kedua yakni variasi suhu 45, 50, dan 55^{o}C. Pengaruh pH dan suhu terhadap kemampuan aktivitas enzim protease LG-37 merupakan variabel bebas, sedangkan aktivitas enzim protease sebagai variabel terikat. Parameter utama yang diamati adalah nilai unit aktivitas protease dan parameter pendukungnya adalah berat kering biomassa sel. Data yang diperoleh dianalisis menggunakan *Analysis of Variance* (ANOVA) dan dilakukan uji lanjut dengan Uji *Duncan Multiple Range Test* (DMRT).

Hasil penelitian menujukkan bahwa pH dan suhu berpengaruh terhadap aktivitas enzim protease isolat LG-37 asal sedimen mangrove Pantai Logending. Aktivitas protease tertinggi diperoleh pada perlakuan kombinasi pH 6 dan suhu 50^{o}C dengan nilai unit aktivitas protease sebesar 1,067 U/mL.

Kata Kunci: *Aktivitas Enzim, Bakteri Proteolitik, Isolat LG-37, Optimasi, Sedimen Mangrove*

SUMMARY

Protease enzyme is enzyme that function to hydrolyze protein into peptides and amino acids. Each enzyme has different optimal conditions or activities. Enzyme activity is influenced by various including pH and temperature. This research aimed to determine the effect of pH, temperature and their combination on protease activity of LG-37 bacterium isolated from Logending Beach mangrove sediment.

The research method was carried out experimentally using a factorial Completely Randomized Design (CRD) with two factors. Each factors was repeated three times. The first factor was variations in pH 4, 5, and 6, while the second factor was variations in temperature 45, 50, and 55^{o}C. The effect of pH and temperature on the ability of the protease enzyme activity of LG-37 was the independent variable. The protease enzyme activity was the dependent variable. The main parameter observed was the protease activity unit value. The supporting parameter was the dry weight of cell biomass. The data obtained were then analyzed using Analysis of Variance (ANOVA) and continued with the Duncan Multiple Range Test (DMRT).

The results showed that pH and temperature affected the protease enzyme activity of LG-37 isolate from Logending Beach mangrove sediment. The highest protease activity was obtained in the combination treatment of pH 6 and temperature of 50^{o}C with a protease activity unit value of 1.067 U / mL.

Keywords: *Enzyme Activity, LG-37 Isolate, Mangrove Sediment, Optimization, Proteolitic Bacteria*